CHAPTEE XIV

AIR REQUIREMENT FOR COMBUSTION OF THE GAS IN THE OPEN-HEARTH FURNACE.

As a result of practice it is shown that the fuel will be completely burnt in the open-hearth furnace with 1*3 times the theoretical amount of air, since analyses from different works show that with such air ratios no trace of combustible gas is any more contained in the waste gases. Professor Mayer found, on the other hand (" Stahl und Eisen," 1908, p. 725), that with 1*21 times the amount of air, still not quite complete combustion took place, in that the composition of the waste gas, viz.:—C02 14'2 per cent.-f CO Ol per cent. + O 3-8 per cent.-fN 81*9 per cent., still showed perceptible CO content.

The determination of the quantity of air to introduce into the furnace may therefore, however, not be based on the theoretical air requirement, which is required for the combustion of the gas, since, if one increases this amount up to 1'30 times the quantity of air will in accordance with practice turn out too low. The figure 1*3 relates to the total quantity of air requisite for the combustion of the raw fuel, of which, however, a portion has already been employed for gasification, and this portion may not be disregarded.

If one wishes to accurately determine the air requirement, which indeed is of value for theoretical considerations, one cannot well proceed from the elementary analysis of the fuel, but one may suitably select the products of complete combustion as a basis, or else, in case the composition of the heating gas Is determined, obtain all requisite data from this. As an example of such a calculation, let the so-called best producer gas on p. 78 be selected.

The quantity of air required for its complete combustion